A SURVEY OF THE RELATIONSHIPS BETWEEN INTEREST AND ABILITIES OF HIGH SCHOOL FRESHMEN AND SOPHOMORES OF JUNCTION CITY HIGH SCHOOL

by

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INTRODUCTION

The relationship between interest and ability is an issue which, at the present time, remains one of the areas where more research needs to be done. If counselors are to be more effective in counseling vocational clients, they need to know more concerning the relationships between interests and abilities. The limited research to date does not show any significant relationship that would enable a vocational counselor to predict one's interests from his abilities or his abilities from his interest patterns.

A great deal is known concerning interest and ability, but very little is known concerning the relationship between interest and abilities.

The conclusion reached by Strong, according to Super, was that interest reflects ability, but the author goes on to say that there was not enough evidence to support or reject this inductive hypothesis.[1] It was the observation of Strong that ability must be determined by some other means than expressed interest; however, expressed interests may be clues as to what abilities may be present.[2] The author further states:

> Although the results of our research indicates that there is some relationship between interests and

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[1] Donald E. Super, Appraising Vocational Fitness (New York: Harper and Brothers, 1949), pp. 396-399.

[2] Edward K. Strong, Vocational Interests of Men and Women (Stanford University Press, 1943), p. 16.

aptitudes, so far the relationship has not been established.[1]

Bennett, Seashore, and Wesman suggest that, from the results of their study, those who presume that there is a relationship between interest and ability will be surprised at their results. Only two of the pairings in their study of the relationship between interest and ability reveal consistent and significant relationships, and in both cases for boys only. Here the Differential Aptitude Test area of mechanical aptitude compared with the Kuder mechanical interest gave correlations of .40 for grade ten, .43 for grade eleven, and .38 for grade twelve. The D. A. T. Mechanical Reasoning correlated with the Kuder Scientific scale gave .32 for grade ten, .45 for grade eleven, and .44 for grade twelve. The authors go on to say:

> It appears that, for the most part, Kuder interest categories have little to do with measured aptitudes. It is perhaps unnecessary to remind experienced counselors of the great risks in basing counseling on interests or interest scores without corresponding information regarding abilities.[2]

The vocational counselor would have to take both interest test and aptitude test results into consideration if he expects to be successful with his counseling. Each should act as an independent source of information, each contributing its share to the success of the vocational counseling process.

The purpose of this study was to ascertain the following:

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[1] Ibid., p. 24.

[2] George K. Bennett, Harold G. Seashore, Alexander G. Wesman, Differential Aptitude Tests Manual, second edition, (New York: The Psychological Corporation, 1952), p. 71.

1. The relationship between aptitude and interest as measured by the Differential Aptitude Test battern and the Kuder Preference Record when these tests were administered to 241 boys and girls of the Freshman and Sophomore level in Junction City Junior-Senior High School, using the conventional method of correlation when the scores represent deviations from the group mean.

2. The relationship between aptitude and interest when the Wesley technique of computing the intercorrelation between scores on the Kuder Preference Record and the Differential Aptitude Test battery when the scores represent deviations from the individual's own rather than the group mean was used.[1]

The Wesley technique will be more fully discussed later on in this report.

PROCEDURE

The Differential Aptitude battery and the Kuder Interest Preference record were used as instruments in obtaining aptitude and interest scores for comparative purposes.

Eight basic areas make up the D. A. T. battery.[2] Each area was developed as an independent aptitude test, and the tests may be given independently or as a battery depending upon the situa-

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[1] S. M. Wesley, Douglas Q. Corey, and Barbara M. Stewart, "Intra-Individual Relationship between Interest and Ability," Journal of Applied Psychology, June 1950, 3:193-197.

[2] Bennett, Seashore, and Wesman, op. cit., p. 5.

tion. The tests have advantages over assembled batteries in that they are developed as an integrated battery with standardization of all eight tests based on a single population.[1]

All of the areas but one measure power rather than speed. The authors felt that aptitude tests should determine the level at which a person can perform. There are those tasks for which it is necessary to ascertain speed and accuracy, but they felt that an individual's power is of primary concern. "The principle underlying the Differential Aptitude Test is that the level of operation is usually the most important aspect of abilities which the counselor and his client need to consider."[2]

The Clerical Aptitude test is the only test which is a test of speed and accuracy; the rest are power tests.

The following areas compose the D. A. T. Aptitude battery:

1. Verbal Reasoning.
2. Numerical Ability.
3. Abstract Reasoning.
4. Space Relations.
5. Mechanical Reasoning.
6. Clerical Speed and Accuracy.
7. Language Usage.

The Verbal Reasoning test consists of verbal analogies which are designed so that the student must be able to generalize and to think constructively rather than just simple fluency or vocab-

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1 Ibid., p. 3.
2 Ibid., p. 4.

ulary recognition. The items used in this test are highly reliable, there being only one chance in 16 of the individual's guessing the correct answer. This leaves no need for a scoring formula to do away with the element of chance. The item types are variable in that they represent many different subject fields. They sample the general knowledge of the student and how well he is able and capable of seeing relationships within that knowledge.[1]

The Verbal Reasoning test is so designed that the vocabulary is familiar and the context relatively simple, but the solution cannot be derived through simple association. It is not necessary to select rare items of knowledge from subject matter fields in order to arrive at additional item difficulty. This is done through the function of the reasoning process required.

The Verbal Reasoning test is associated with general intelligence and is found to correlate very highly with some general intelligence tests.[2]

Numerical computation problems make up the Numerical Aptitude test. The items are so designed that careful reasoning is demanded by the individual taking the test. Logical reasoning is arrived at by requiring an individual to reduce an answer down to its lowest terms in order to be right. The items advance from relatively simple computation problems to the more complex. The test is designed to test numerical relationship and facility in handling numerical concepts. Reading ability does not play an

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1 Ibid., p. 6.
2 Ibid., p. 72.

important part in the test as all items are numerical problems requiring reasoning and logic. The test was found to be stimulating to all levels of students who took it. According to the authors, "The numerical ability test is a measure of the student's ability to reason with numbers, to manipulate numerical relationships, and to deal intelligently with quantitative materials. It teams with the Verbal Reasoning test as a measure of general learning ability."[1]

The Abstract Reasoning test is a series of diagrams which follow a logical pattern. The student is asked to determine which would be the next logical selection in the sequence of diagrams. It is not a test of visual acuteness as the diagrams are large and clear and do not require the student to discriminate between lines or areas which differ but slightly in size or shape. It, like the Verbal Reasoning test, is a test of nonverbal content placing no premium on reading ability. The authors state that, "Complexity is obtained from increasing conceptual difficulty; the differences are apparent, discerning why the patterns differ is the intellectual exercise."[2]

The Space Relations test of the Differential Aptitude battery is designed to determine an individual's ability to visualize a constructed object from a pattern. The test is so designed that it is a test of visual perception and mental manipulation of objects in three dimensional space. The items may be rotated

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1 Ibid., p. 6.
2 Ibid., p. 7.

in various ways, thus measuring space perception. The objects are large and clear, and perception of difference is very easy. The task is solely that of determining how the objects would look if constructed and then visualized from different angles.

Bennett, Seashore, and Wesman state that:

> The Space Relations test is a measure of ability to deal with concrete materials through visualization. This ability to manipulate things mentally, to create a structure in one's mind from a plan, is what the test is designed to evaluate.[1]

The Mechanical Aptitude test is composed of pictorially presented mechanical situations which are simple, everyday mechanical situations. The students who score high on this test find it easy to learn the principles of operation and repair of complex devices. The author states that:

> The score is affected by the previous experience of the subject but not to a degree that introduces serious difficulties in interpretation. Formal training in physics produces an increase in score of only a few points.[2]

Girls' mean scores are significantly lower than boys on the norm scale. Thus the scores are of less value for vocational and educational counseling for girls than they are for boys. If a girl is interested in a mechanical area, it would probably be well for the counselor to compare her scores with the boys in her grade rather than the girls.[3]

The Clerical Speed and Accuracy test is designed to measure speed and accuracy in the perception and recording of simple let-

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1 Loc. cit.
2 Loc. cit.
3 Loc. cit.

ler or number combinations. The student finds the pair which are underlined in the test booklet, then locates that same pair on a separate answer sheet. The test is composed of two parts with time limits of three minutes each. It is the only test in the battery which is strictly a time and accuracy test and not a work limit test. Intelligence is not involved, as little or no intellectual difficulty is encountered. The individual is not penalized for making incorrect responses as the score is the number right. It was found that very few mistakes are made on a task as relatively simple as this.[1]

The Language Usage test is composed of two parts: Spelling and Sentences. The words were selected from Gates' list of spelling difficulties in 3,876 words. The words misspelled most frequently were also selected because of their prominence in everyday vocabulary. Every item contributes its share to the effectiveness of the measurement making the test reliable.

The Sentence part of the Language Usage test is a test of proper use of grammar, punctuation, and word usage. The student is presented with five parts to each sentence which he must inspect and determine whether it is correct or incorrect. The effect of chance is minimized by the number of possibilities on the test. This test is more of an achievement test than any of the other tests in the battery. Language usage is considered important enough by the authors in so many vocations in life to be

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[1] Ibid., p. 8.

included in this aptitude battery.[1]

The other test used in the study was the Kuder Interest Preference Record, Form B. B. This was designed to reveal an individual's interest pattern from preferences that he may express on the test. The test has 504 possible choices which are marked as to those that he likes best to do and those he likes least to do in each group of three. The results of the test are divided into nine basic interest fields: Mechanical, Computational, Artistic, Social Service, Clerical, Persuasive, Musical, Literary, and Scientific.

The preceding tests were administered to 119 Freshman, Sophomore girls and 122 Freshman, Sophomore boys. The tests were administered in regular class sessions which involved all the students in those classes. Required courses were selected so that all students were represented in the classes chosen. The tests were administered during regular class periods with regular class atmosphere prevailing. The results of the tests were hand scored by the investigator to insure accuracy. The required correlations were computed by the Statistical Laboratory, Kansas State College, Manhattan, Kansas.

Table 1 gives the means and standard deviations for 112 Freshman, Sophomore boys and 119 Freshman, Sophomore girls of Junction City High School for Differential Aptitude areas and the Kuder Preference Record areas.

In order to better describe the nature of the groups util-

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[1] Loc. cit.

Table 1. Means and standard deviations for 112 Freshman, Sophomore boys and 119 Freshman, Sophomore girls of Junction City High School for Differential Aptitude areas and the Kuder Preference Record areas.

		V.R.	N.A.	A.R.	S.R.	M.R.	C.S.R.	S.P.	S.E.
Freshman boys	M	21.9	18.0	31.7	44.1	38.6	53.4	37.3	26.3
	S	7.23	7.39	6.89	21.09	11.83	8.37	25.05	14.14
Freshman girls	M	19.9	16.3	26.5	34.8	23.1	58.4	46.2	33.9
	S	9.76	8.34	12.23	21.05	9.29	10.61	26.03	14.73
Sophomore boys	M	22.5	20.4	32.4	52.0	40.3	56.1	37.8	28.0
	S	10.56	9.86	9.59	25.12	11.89	8.87	27.63	16.34
Sophomore girls	M	20.9	15.5	27.6	37.8	23.8	62.9	45.0	31.8
	S	10.06	9.54	11.61	22.06	11.43	9.43	25.86	16.86

Table 1. (cont.)

		Mech.	Comp.	Sci.	Per.	Art.	Lit.	Mus.	Soc.	Cler.
Freshman boys	M	81.4	33.3	69.1	60.8	52.4	42.4	16.3	65.4	51.2
	S	20.87	9.05	12.72	10.10	12.19	12.68	9.01	18.11	10.32
Freshman girls	M	41.7	29.0	47.3	59.8	57.1	49.0	26.3	79.3	64.8
	S	13.83	7.60	13.44	12.70	14.39	11.47	18.97	14.93	14.40
Sophomore boys	M	80.1	34.2	68.2	67.0	50.7	42.4	18.5	59.9	50.1
	S	20.53	12.87	17.80	12.76	16.00	10.38	11.37	15.54	10.71
Sophomore	M	46.9	29.1	53.0	61.5	52.8	46.0	25.6	82.3	64.3
	S	14.29	9.73	14.06	11.69	14.14	13.23	10.18	19.22	16.20

ized in this study, a comparison of the results of four different groups with the corresponding normative groups reported in the Differential Aptitude Manual[1] and the Kuder Preference Manual was necessary.[2] Means of the aptitude and interest areas are compared with the norm groups found in the manuals. The aptitude area in the report was compared with the percentile rank on the normative scale in the Differential Aptitude Manual.

The Freshman boys gave three areas where the mean ranked at the 55 percentile rank on the normative scale given by Bennett, Seashore, and Wesman. One of the areas ranked at the 65 percentile rank, one at the 70 percentile rank, one at the 75, two areas ranked at the 60 percentile rank. All standard deviations tended to be smaller except the Spelling and Sentence area where they were slightly larger. The Sophomore boys gave means on the groups studied which corresponded with the normative group as follows: Four were above the 50 percentile rank ranging from the 70th down to the 55 percentile rank. Two areas were at the 50th percentile rank with two falling below to the 45 percentile rank. Five of the standard deviations on the groups studied were slightly above those on the normative group and three were below.

As far as Sophomore and Freshman boys are concerned, this would indicate that on the group as a whole they tend to be slightly superior to the normative group given in the manual.

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[1] Ibid., pp. 26-27.

[2] Kuder, Frederic, Revised Manual for the Kuder Preference Record, Science Research Associates, Chicago, Illinois, 1946, p. 21.

The standard deviations tended to be smaller on the Freshman boys and larger on the Sophomore boys.

The Freshman girls were above the normative groups, Form A, reported in the Differential Aptitude Manual, but not to the extent that the boys were. All areas of the Differential Aptitude tests ranked either at the 50 or 55 percentile rank with the exception of the Clerical Speed and Accuracy which ranked at the 70 percentile rank on the norm in the manual. The standard deviations were all above those given by Bennett, Seashore, and Wesman with the exception of two--Mechanical Reasoning and Clerical Speed and Accuracy--which were slightly below.

The Sophomore girls tended to fall below the groups reported in the Differential Aptitude Manual with the exception of two areas, the Space Relations and the Clerical Speed and Accuracy, which ranked at the 50 percentile for the Space Relations and the 65 percentile for the Clerical Speed and Accuracy.[1]

There was a tendency for the Clerical Speed and Accuracy to rank well above the 50 percentile rank for all the groups as compared with the norm group in the Differential Aptitude Manual, ranging from the 65 percentile rank up to the 75th. The standard deviation tended to be smaller for all four groups in this area from the norm group reported by Bennett, Seashore, and Wesman.

The Sophomore girls tended to fall slightly below the norm group in general ability. Both Freshman and the Sophomore girls

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[1] Bennett, Seashore, and Wesman, op. cit., pp. 26-27.

did not show as much tendency to be above the normative group as do the Freshman and the Sophomore boys. This would indicate that the boys were slightly superior to the girls in Junction City considering their relation to the norm groups given in the Differential Aptitude Manual.

The following is a comparison of the mean scores derived from this study on the Kuder Preference Record, Form B. B., as compared with the normative scale given in the Kuder Preference Manual, Table 7, based on 1,858 high school boys and 2,005 high school girls.[1] The Mechanical area gave a mean of 77.74 in the Kuder manual as compared to 81.4 for Freshman boys and 80.1 for Sophomore boys in this study with a standard deviation of 20.20 in the manual as compared to 20.87 Freshman boys, 20.53 Sophomore boys.

The Computational area gave a mean of 35.22 in the manual as compared with 33.3 and 34.2 Freshman, Sophomore boys in Junction City. A standard deviation was found to be 10.37 in the manual compared to 9.05 for Freshman and 12.87 for Sophomore boys. Scientific area of the Kuder gave a mean of 68.22 with a standard deviation of 15.81 in the manual compared with a mean of 69.1 and 68.2 Freshman, Sophomore boys with a standard deviation of 12.72 for Freshman and 17.80 for Sophomore boys.

The Persuasive area compared with the Freshman and Sophomore boys in the report gave a mean of 66.94 in the manual compared to 60.8 for Freshman boys and 67.0 for Sophomore boys.

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[1] Kuder, Frederic, op. cit., p. 21.

The standard deviations were 14.82 as compared with 10.10 and 12.76 in this study. The mean on the Artistic area was 48.02 in the manual as compared to 52.4 and 50.7 on Junction City Freshman, Sophomore boys. The mean on the Literary in the manual was 47.38 and on this study a mean of 42.4 for both Sophomore and Freshman boys. Standard deviations for the above areas were 14.96 in the manual compared to 12.68 and 10.38.

The Musical area gave a mean of 18.42 in the manual compared with 16.3 Freshman boys, 18.5 Sophomore boys with a standard deviation of 10.11 in the manual compared with 9.01 and 11.37 in this study. The Social Service area for high school boys in the manual gave a mean of 61.86 which was below 65.48 for Freshman boys but above 59.9 for Sophomore boys; 18.11 and 15.54 were the standard deviations for the Freshman, Sophomore boys as compared to 15.47 in the manual. The final area on the Kuder Preference Record, the Clerical, had a mean of 53.98 in the manual as compared with 51.2 and 50.1 in this report, with a standard deviation of 12.76 in the manual as compared with 10.32 and 14.40 in the study. No systematic trend seemed to be apparent as some of the means tend to be larger and some smaller, with the same occurrence among the standard deviations of the Freshman, Sophomore boys as compared to the means and standard deviations of the group reported in the manual.[1]

The Freshman girls of Junction City had the following means: Mechanical 41.7, Computational 29.0, Scientific 47.3, Persuasive

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[1] Loc. cit.

59.8, Artistic 57.1, Literary 49.0, Musical 26.3, Social Service 79.3, and Clerical 64.8 as compared with the high school girls in the manual, which yielded mean scores of: Mechanical 49.90, Computational 28.94, Scientific 52.64, Persuasive 65.58, Artistic 52.22, Literary 49.22, Musical 23.68, Social Service 79.18 and Clerical 63.26. The Sophomore girls had means of: Mechanical 46.9, Computational 29.1, Scientific 53.0, Persuasive 61.5, Artistic 52.8, Literary 46.0, Musical 25.6, Social Service 82.3, and Clerical 64.3. As with the Freshman, Sophomore boys, no systematic trend was apparent as in some areas the mean tends to be higher on the normative groups in the manual and lower in others. This was also true of the standard deviations for the girls.[1]

In defining the groups, one would say that the Junction City boys and girls showed a tendency to be above the normative group found in the Differential Aptitude Manual as an over-all trend, but this did not prove to be so on the Kuder interest scale. On the Kuder interest scale, as many areas tended to be below as above the normative group given in the manual.

The study of Corey was used as a prototype for this study. He concluded from a study by Segel that, if the intra-individual relationships were taken into account, much higher correlations would be found between interest and ability. Corey states that:

> The general impression given by the literature is that where adequately standardized and validated measures of interest and abilities were used, low

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[1] Loc. cit.

> but significant correlations were shown. When other investigators failed to show such a relationship it seemed to be due to (1) use of an inadequately standardized interest inventory; (2) use of a very small number of cases; and (3) use of dubious criteria for judging interest and/or ability.[1]

In the Corey study, the Kuder Preference Record was used as a measure of vocational interest, while the ability tests were selected from several standardized tests. For the Literary and Computational areas of the Kuder inventory two tests were used, The Iowa High School Content Examination English, and the Army Alpha V were each correlated against the Literary interest. The Stanford Achievement Test, Advanced Arithmetic Tests, and the Army Alpha N were each correlated with the Computational interest. For the other Kuder interest areas corresponding ability tests were the Minnesota Vocational Test for Clerical Workers, Survey of Mechanical Insight, Iowa High School Content Examination-Science, Meier Art Tests-Art Judgment, and the Seashore Measures of Musical Talent, respectively.[2]

From the results of his study it is the general conclusion of Corey that:

> It seems almost certain that an individual's relative ability scores correlate higher with his interests than do his uncorrected ability scores. To determine the relationship between interest and ability, it is more important to know the magnitude of that score relative to the individual's own mean level of ability than to just know its magnitude as a deviation from the group mean. (Of course in computing relative devia-

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[1] D. Q. Corey, A Comparison of Two Methods of Determining the Relationship between Vocational Interests and Abilities. Unpublished Master's Thesis, University of Southern California, 1947, p. 24.

[2] Ibid., pp. 39-41.

tions it is necessary to first know the deviation from the group.)[1]

Corey found the group correlation between each Kuder area and its corresponding ability area. Then the ability areas were corrected for mean level of ability and relative correlation was found. He then computed the standard error of measurement and the ratios indicating the significance of their difference.[2] He found that correlations in six of the areas were significant at the one per cent level of confidence. These were literary, mechanical, scientific, computational, artistic, and literary (Alpha V). For the musical area significance at the five per cent level of confidence was found for both areas. The group correlation was not significant for the clerical area, but, when intra-relative technique was used, they became significant at the one per cent level of significance.

"A third test of significance was applied. After the group correlations had been corrected, they all increased." The group correlation between clerical interest and the Minnesota Vocational Test for Clerical Workers was not significant, but when the ability scores were corrected, they became significant at the one per cent level of confidence.[3]

Data were completed for 101 male college students in the Corey study. Interest and abilities were ranked in order, and the number of cases was found where interest number one ranked

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[1] Ibid., p. 44.
[2] Ibid., p. 39.
[3] Ibid., pp. 41-42.

with ability number one for the same case. Thus the highest ability could be said to rank the first, second, third, fourth, fifth, sixth, or seventh interest. Next the number was found who had the second highest interest in their number one ability field on down to the seventh interest field. It was found that 31 cases out of 101 had the same highest interest and ability field. In the second highest interest field there were 16, fifth highest interest field had ten, sixth interest field had six, and the seventh interest field had four.[1]

The results of Corey's study showed that approximately 31 per cent had their highest interest and ability in the same area. Fifty-one per cent of the group had their first or second highest interest score in the same area as their highest ability. Chance would have permitted only 28 per cent. Predictability is 22 per cent better than chance.[2]

RESULTS

For the purposes of this study it was necessary to divide the subjects into four categories: 56 Freshman boys, 58 Freshman girls, 66 Sophomore boys, and 61 Sophomore girls.

Table 2 represents the results of the investigation of the relationship between interest and aptitude of Freshman boys using first the conventional method of correlation signified by

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1 Ibid., pp. 45-46.
2 Ibid., p. 47.

Table 2. Correlation coefficients of the Differential Aptitude tests with the Kuder interest areas for Freshman boys (N = 56).

		Mechanical	Computational	Scientific	Persuasive	Artistic	Literary	Musical	Social Service	Clerical
VR	U	.053	.438*	.239	-.172	-.307*	.362*	-.263*	-.158	.013
	A	-.184	-.137+	-.225+	.165+	.143+	.468*	-.157	.010	.196
NA	U	.220	.557*	.414*	-.315*	-.159	.046	-.114	-.196	-.158
	A	.004	.016+	-.067+	.002+	.156+	.150	.001	-.069	.007
AR	U	.165	.475*	.312*	-.135	.042	-.008	-.257	-.159	.058
	A	-.058	-.100+	-.158+	.175+	.293*	.051	-.062	.063	.199
SR	U	.256	.227	.192	-.140	.006	-.143	-.159	-.089	-.178
	A	.236	.044	.039	.001	.137	-.158	-.155	-.057	-.158
MR	U	.650*	.293*	.268*	-.232	-.128	-.121	-.295*	-.224	-.204
	A	.606*	-.061+	-.025+	-.040	.056	-.096	-.262*	-.157	-.120
CSA	U	-.071	.141	.107	-.019	.104	-.156	.217	-.046	-.080
	A	-.230	-.304*+	.264*	.228	.308	-.087	.280	.072	.056
SP	U	-.235	.345*	.291*	.209	-.036	.035	.138	.072	-.078
	A	-.370	.226	.191	.260	.058	.066	.213	.356*+	.318*+
SE	U	.013	.350*	.355*	-.243	-.274	.008	-.056	-.125	-.013
	A	-.149	.091+	.161	.052	.188+	.061	.007	-.072	.107

* Identifies coefficients of correlations which were significant at the five per cent level of confidence.

\+ Identifies coefficients of correlations with significant different relations between two procedures, U and A, at the five per cent level of confidence.

the letter U and second the intra-individual relationship designated as the Wesley technique and signified by the letter A. Correlations were computed between all areas of the Differential Aptitude Tests and the Kuder Preference Record, Form B. B. Among the 72 relationships studied, using the conventional group method of correlation, 17 were significant at the five per cent level of confidence.

Those significant to the five per cent level were Verbal Reasoning in comparison with the Computational, Artistic, Literary, and Musical of the Kuder Preference scale; Numerical versus Computational, Scientific, Persuasive; Abstract versus Computational, Scientific; Mechanical Reasoning versus Mechanical, Computational, Scientific; Spelling versus Computational, Scientific. Twelve of those relationships were low, correlations falling in the twenties or thirties. Six of those relationships were positive aptitude relationships with computational as follows: Verbal Reasoning .438; Numerical Ability .557; Abstract Reasoning .475; Mechanical Reasoning .293; Spelling .345; and Sentences .350. Five were positive ability relationships with Scientific as follows: Numerical Ability .414; Abstract Reasoning .312; Mechanical Reasoning .268; Spelling .291; and Sentences .355.

Among the 72 relationships studied using the Wesley technique, nine of the areas were statistically significant, but only three were for the same two variables as in the use of the conventional method of correlation. The Verbal Reasoning and Literary gave a positive relationship of .362 using the conven-

tional method of procedure, and .468 using the Wesley technique. Mechanical Reasoning versus Mechanical interest resulted in a .650 relationship using the group method, and .606 using the relative method. In comparison with the Musical area, the Mechanical Reasoning test gave a correlation of -.295 using the group method, and -.262 using the relative procedure of Wesley's. These findings do not indicate that the relative method of procedure increases the magnitude of the relationships as indicated by the Wesley study.

There were only 18 statistically different correlations between the two methods. These were found in the relationship of Verbal Reasoning to Computational, Scientific, Persuasive, and Artistic; Numerical Ability to Computational, Scientific, and Persuasive; Mechanical Reasoning to Computational, Scientific; Clerical Speed and Accuracy to Computational; Spelling to Social Service and Clerical; Sentences to Computational and Artistic. However, there was no systematic trend in the direction of an increase in the magnitude of the correlations when the Wesley method was compared with the conventional method.

Table 3 gives inter-correlations for the Sophomore boys. Only four of the 72 gave any significant correlations for the group method. These were the Verbal Reasoning versus Clerical -.325; Numerical versus Computational .420; Abstract Reasoning versus Clerical -.259; Mechanical Reasoning versus Scientific .344; Mechanical Reasoning versus Clerical .420. Three of these were Verbal Reasoning, Abstract Reasoning, Mechanical Reasoning versus Clerical on the interest scale.

Table 3. Correlation coefficients of the Differential Aptitude tests with the Kuder interest areas for Sophomore boys (N = 66).

		Mechanical	Computational	Scientific	Persuasive	Artistic	Literary	Musical	Social Service	Clerical
VR	U	-.123	.193	.148	.093	.164	.128	.070	-.120	-.325*
	A	-.090	-.038	-.002	.074	.013	.065	-.048	.039	-.016+
NA	U	-.023	.420*	.056	-.072	.065	-.019	-.052	-.159	-.026
	A	-.012	.075+	.019	-.017	-.035	-.018	-.113	.022	.153
AR	U	.204	.172	.157	.112	.138	-.107	.081	-.058	-.259*
	A	.262	-.059	-.005	.079	.002	-.063	-.040	.078	.036
SR	U	.131	.231	.113	-.029	.186	-.048	.132	-.213	-.224
	A	.133	.124	.050	-.014	.137	.082	.069	-.136	-.121
MR	U	.257	.124	.344*	.029	.236	-.221	.075	-.236	.420*
	A	.131	-.054	.107	.032	.065	-.119	-.036	-.035	-.080+
CSA	U	-.170	.053	-.130	.121	.116	-.017	.125	-.157	-.085
	A	-.073	-.110	-.134	.071	-.013	-.014	-.025	.029	.116
SP	U	-.052	.137	.050	-.018	-.061	.039	.123	-.083	-.132
	A	-.051	.038	-.008	-.004	-.106	.033	.063	-.011	-.018
SE	U	-.188	.200	.193	-.038	-.013	.206	.149	-.047	-.236
	A	-.154	.027	.078	-.012	-.076	.162	.041	.061	-.077

* Identifies coefficients of correlations which were significant at the five per cent level of confidence.

\+ Identifies coefficients of correlations with significant different relations between two procedures, U and A, at the five per cent level of confidence.

Only Numerical versus Computational and Mechanical versus Scientific gave similar significant relationships for both Freshman and Sophomore boys using the group method of correlation. Numerical Ability versus Computational on the Freshman boys correlated .557, on the Sophomore boys .420. Mechanical versus Scientific was .268 and .344, respectively.

Use of the Wesley method failed to yield any significant correlations.

Statistically significant differences between the two methods were found in only three instances--Numerical Ability versus Computational interest, which yielded a correlation of .420 for the group method and .075 for the Wesley intra-related technique; Verbal Reasoning versus Clerical interest gave a correlation of -.325 by the group method and -.016 by the intra-related technique; and Mechanical Reasoning versus Clerical was .420 and -.080, respectively. These significant differences do not indicate a trend which would substantiate Wesley, Corey, and Stewart's hypothesis in their study.

Table 4 shows the correlations for the Freshman girls between all areas of the Differential Aptitude battery and the Kuder interest test.

Use of the group method of correlation revealed only three significant correlations. Verbal Reasoning versus Mechanical gave a correlation of .282. Verbal Reasoning versus Literary gave a correlation of .274. Sentences versus Mechanical gave a correlation of -.381.

Use of the relative technique revealed only two significant

Table 4. Correlation coefficients of the Differential Aptitude tests with the Kuder interest areas for Freshman girls (N = 58).

		Mechanical	Computational	Scientific	Persuasive	Artistic	Literary	Musical	Social Service	Clerical
VR	U	.282*	-.036	-.012	.168	.112	.274*	.069	-.121	.072
	A	-.009	-.012	.041+	.057	-.298*+	.128	.102	-.003	.065
NA	U	-.118	-.160	-.060	-.040	.217	-.009	-.031	-.242	-.073
	A	.187+	-.094	.009	-.156	-.058	-.144	.026	-.098	-.063
AR	U	-.092	-.011	-.064	.014	.222	-.067	-.011	-.133	-.029
	A	.133	.031	.014	-.077	.010	-.176	.031	-.042	-.027
SR	U	-.118	.072	.001	.027	.203	-.015	.024	-.052	-.036
	A	.099	.109	.142	.116	.106	-.083	.054	.003	-.039
MR	U	.060	-.093	.038	.128	.166	-.029	-.078	.024	-.245
	A	.269*	-.031	.069	.011	-.066	-.124	-.019	.115	-.187
CSA	U	-.036	.097	.014	.054	.016	.082	.013	-.061	.126
	A	.183+	.123	.059	-.039	-.174	-.027	.051	.040	.112
SP	U	-.230	-.155	-.155	.134	.130	.197	-.064	-.079	.000
	A	-.155	-.156	-.143	-.109	.047	.176	-.053	-.041	.003
SE	U	-.381*	.055	-.004	.109	.228	.143	-.082	-.085	.089
	A	-.234	.103	.042	.044	.082	.071	-.057	.008	.107

* Identifies coefficients of correlations which were significant at the five per cent level of confidence.

\+ Identifies coefficients of correlations with significant different relations between two procedures, U and A, at the five per cent level of confidence.

correlations--Verbal Reasoning versus Artistic, with a correlation of -2.98, and Mechanical Reasoning versus Mechanical interest, with a correlation of .269. This would indicate no trend that, through intra-individual correlations relative to the individual's own mean than to the group mean, one would get higher correlations between interest and abilities.

In comparison of the two methods, one finds only four cases of significant difference. They are as follows: Verbal Reasoning versus Scientific, a correlation of -.012 on the group method and .041 using the relative technique; Verbal Reasoning versus Artistic interest, a correlation of .112 by the conventional method and -.298 by the relative method; Numerical Ability versus Mechanical interest, -.118 by the group method and .187 by the Wesley technique; Clerical Speed and Accuracy versus Mechanical, -.036 by the group method and .183 by the Wesley technique. No systematic trend was found to support the findings of Wesley, Corey, and Stewart.

Table 5, Sophomore girls, shows only two significant correlations by the group method. Numerical Ability gave a correlation of .289 with Scientific interest and a correlation of .257 with Literary interest. This indicated no trend toward substantiating Wesley's theory, and no trend was apparent when compared with the Freshman girls.

Use of the Wesley technique intra-relative correlations gave five significant relationships. Numerical Ability versus Computational gave a correlation of .428; Space Relations versus Artistic interest gave a correlation of .379; Clerical Speed and

Table 5. Correlation coefficients of the Differential Aptitude tests with the Kuder interest areas for Sophomore girls (N = 61).

		Mechanical	Computational	Scientific	Persuasive	Artistic	Literary	Musical	Social Service	Clerical
VR	U	-.171	.009	.176	-.162	-.201	.120	.020	.134	.003
	A	.018	.138	-.165	.037	-.048	-.045	.186	.191	-.089
NA	U	-.094	.156	.289*	-.103	-.230	.257*	-.042	-.057	.004
	A	.180+	.428*	.002+	.167	-.088	.189	.096	-.148	-.100
AR	U	-.046	.014	.154	-.051	-.173	.086	.043	.034	.084
	A	.131	.090	-.097	.127	-.027	-.048	.141	.017	.043
SR	U	.057	-.019	.254	-.015	.160	.059	-.226	-.059	.173
	A	.222	.022	.227	.109	.379*	-.012	-.294	-.110	.234
MR	U	-.059	-.013	.207	.022	-.019	.063	-.174	-.054	.014
	A	.132	.066	-.043	.241	.175	-.087	-.126	-.099	-.045
CSA	U	.002	.031	.037	-.004	-.017	.007	-.001	.084	.012
	A	.203	.374*+	.280*	-.187	-.340*+	.150	.101	.023	.056
SP	U	-.031	.020	-.039	-.248	-.145	.017	.025	.043	.220
	A	.051	.002	-.186	-.226	-.099	-.051	.076	.044	.254
SE	U	-.194	-.053	.154	-.176	-.241	.149	-.015	.112	.009
	A	-.141	-.016	-.014	-.109	-.226	.101	.063	.162	-.039

* Identifies coefficients of correlations which were significant at the five per cent level of confidence.

\+ Identifies coefficients of correlations with significant different relations between two procedures, U and A, at the five per cent level of confidence.

Accuracy versus Computational gave a correlation of .374; Scientific .280; and Artistic -.340.

In comparing the significent differences between the two methods for the Sophomore girls, only four were found. Numerical Ability versus Mechanical interest gave a correlation of -.094 using the group method and a correlation of .180 using the intra-relative technique. Numerical Ability compared to the Scientific area gave a correlation of .289 group method to a correlation of .002 using the intra-relative technique. Clerical Speed and Accuracy compared with the Computational area revealed a correlation of .031 using the group method and .374 using the Wesley technique. The Artistic interest area correlated with the Clerical Speed and Accuracy on the group method with a correlation of -.017 to a correlation of -.340 using the intra-relative technique.

Again no systematic trend was discovered giving any support to the Wesley, Corey, and Stewart theory.

CONCLUSIONS

There was a tendency among the Freshman boys for Computational interest to be positively and significantly related to the aptitude areas of Verbal Reasoning, Numerical Aptitude, Abstract Reasoning, Mechanical Reasoning, Clerical Speed and Accuracy, Spelling, and Sentences. Numerical gave the highest correlation of .557 with the Computational interest area. Mechanical interest versus Mechanical aptitude in the study gave a correlation

of .65 using the group technique. The only comparable study available, reported in the Differential Aptitude Manual, also gives a significant correlation of .40, .43, and .38 for Sophomore, Junior, and Senior boys in the above comparison. On the remaining three groups in this report, this did not hold true. This seems to indicate a trend which needs to be further explored.

The Wesley, Corey, and Stewart technique of determining an individual's deviation from his own mean rather than the group mean did not indicate any significant effect on the relationship between interest and ability resulting in any systematic trend. Thus this study did not find that the Wesley method increases the relationship between interest and ability.

The lack of agreement between the present investigation and the Corey study regarding the results obtained by applying the Wesley method may be due in part to several factors.

First, the tests used in this study more closely approximate true aptitude tests than did some of the tests used in the Corey study. The relationship between achievement and interest may be more amenable to demonstration via the Wesley technique than the relationship between interest and more clearly aptitude measures.

Second, the tests were selected by Corey in an attempt to match directly the interest areas on the Kuder, and the study was restricted to such tests. In the present study, no such pairing was attempted, and a priori assumptions were rejected in favor of an empirical test of all possible relationships.

Third, the groups studied differed in educational level with an indeterminate effect upon the means and standard deviations. Corey's study was limited to male college students, while the present investigation was confined to high school Freshman and Sophomore boys and girls.

The Corey study used a sample which was almost twice as large as any of the four samples in the present study.

In general, the present findings do not support the assumption that interest and aptitude are highly related. Measures of both variables should be included in any counseling program.

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A SURVEY OF THE RELATIONSHIPS BETWEEN INTEREST AND ABILITIES OF HIGH SCHOOL FRESHMEN AND SOPHOMORES OF JUNCTION CITY HIGH SCHOOL

by

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PURPOSE

The purpose of this report was to investigate the relationship of interest and ability as determined by the administration of the Differential Aptitude Tests and the Kuder Preference Record to Freshman, Sophomore boys and girls in the Junction City Junior-Senior High School. Statistical procedure utilized was one in which, first, the group mean or normal procedure was utilized, and then a technique employed by Wesley, Corey, and Stewart in their study was used. It was felt by using the technique of Wesley that much higher consistent correlations could be found between interest and ability.

PROCEDURE

The investigator divided the groups down into the following categories: 56 Freshman boys, 66 Sophomore boys, 58 Freshman girls, and 61 Sophomore girls. The group was administered the entire Differential Aptitude battery and the Kuder Preference scale, Form B. B. Inner correlation of all areas was then found, first by the conventional procedure of the group mean, and then by the Wesley method. This procedure was to find the individual's mean on each derived test score and, after finding the mean level of ability for each individual, the respective ability scores were taken as deviations from his own mean. These relative scores were treated as raw scores and correlated with the Kuder interest scores. Previous research had determined that there was

little or no significant correlation between interest and ability to warrant one's predicting interest from ability or ability from interest.

RESULTS

Of the 72 correlations studied of Freshman boys using the conventional procedure, only 17 were statistically significant at the five per cent level or beyond from zero. Twelve of these were of a low significance. Six were positive ability relationships with Computational. Five were positive ability relationships with Scientific.

Among 72 relationships studied using the relative method of procedure, nine were statistically significant, but only three were for the same two variables as in the use of the group method. Seventeen statistically different correlations were found between the two methods. No trend was apparent to support the Wesley theory that, by use of the relative method, the magnitude of the relationships between interest and ability would be increased. There was no systematic trend in this direction.

In group two, Sophomore boys, the group method yielded only four out of 72 correlations that were significant. Three of these were Verbal Reasoning, Abstract Reasoning, Mechanical Reasoning versus Clerical interest.

Of the two groups, only Numerical versus Computational and Mechanical versus Scientific gave similar significant relationships for both Freshman and Sophomore boys.

Using the relative method, no significant correlations were found for group two.

In comparison of the two procedures, only three instances yielded any significant differences. No systematic trend was determined. This did not verify or uphold the Wesley study.

Group three, Freshman girls, using the conventional procedure, yielded only three significant correlations out of 72. Using the relative method, only two were significant. This indicated no trend of increasing the magnitude of the results between interest and ability.

In comparison of the two methods, only four instances of significant different correlations were found between the two methods.

Group four, Sophomore girls, using the conventional approach gave only two significant correlations out of 72, Numerical Ability versus Scientific and Literary. No trend was apparent in this group, or when Sophomore girls were compared with the Freshman girls, to support Wesley's hypothesis.

Using the relative procedure, only five correlations were significant out of the 72--Numerical Ability versus Computational, Space Relations versus Artistic, Clerical Speed and Accuracy versus Computational, Scientific, and Artistic interest fields. No trend was apparent again, or when Sophomore girls were compared with the Freshman girls.

Comparison of the two procedures gave only four significant different correlations. This does not lend support for the Wesley study.

CONCLUSIONS

Among the Freshman boys there was a tendency for Computational interest to be significantly positively related to Verbal Reasoning, Numerical Ability, Abstract Reasoning, Mechanical Reasoning, Spelling, and Sentences using the group method of correlation. Scientific interest also yielded positive correlations which were significant with the following aptitudes: Numerical, Abstract Reasoning, Mechanical Reasoning, Spelling, and Sentences using the group method of correlation. No significant relationships were found among the three remaining groups whether the group or relative method was utilized.

Although some relationships were shown to exist among the Freshman boys, this did not tend to be so for the remaining groups, nor were the relationships among the Freshmen boy sample consistent with the study given in the Differential Aptitude manual. More research needs to be done to explain the relationships that were found for the one group but not consistent in all groups before counselors can feel secure in predicting interest from aptitude or aptitude from interest in these areas where positive relationships were found.

Relative procedure utilized by Wesley, Corey, and Stewart does not affect the relationships between interest and ability in any systematic way. This lack of substantiation may be due to the differences in the groups studied. Corey utilized 101 college males in his study, while the groups in this study represent high school Freshmen and Sophomores.

Another possible factor in the difference may be in the selection of tests. Corey matched every Kuder Preference area with a corresponding aptitude area. Some of those selected come closer to being achievement rather than aptitude tests. More research needs to be done to verify this conclusion.